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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,406	01/09/2004	Masayuki Kobayashi	056203.53141US	6394
23911	7590	02/22/2006	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			DOLAN, JENNIFER M	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/753,406

Applicant(s)

KOBAYASHI ET AL.

Examiner

Jennifer M. Dolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 and 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/9/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group II, claims 5-11, in the reply filed on 10/3/05 is acknowledged. The traversal is on the grounds that the subject matter of the other group of claims is sufficiently close that all groups should be examined in a single application. This is not found persuasive because the particulars required for the method claims, such as constraining the periphery of a blank to form an inner space therein, are not required for the product claims. Similarly, the particulars required for the product claims, such as inclusion of the radiating plate, the chip fixed to an inner bottom surface of the cup portion, and the specific thermal properties of the metal material are not required for the method claims. Hence, the Examiner maintains that the inventions are distinct (see MPEP § 806.05(f), and different searches are required for each group of inventions, such that restriction for examination purposes is proper.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-4 and 12-15 are withdrawn from further consideration as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0017346 to Osada et al. in view of U.S. Patent No. 4,305,088 to Narita et al.

Regarding claims 5-11, as the claims are directed to a semiconductor apparatus comprising a cup-shaped diode base, per se, the method limitations appearing in lines 11-12 of claim 5 and in claims 6 and 7 in entirety have only been accorded weight to the extent that they affect the structure of the completed semiconductor apparatus. Note that "determination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process [i.e., "plastic working by cold extrusion"; "rearward extrusion" and "forward extrusion"], and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior product was made by a different process", *In re Thorpe, et al.*, 227 USPQ 964 (CAFC 1985). Furthermore, note that a "product-by-process claim, although reciting subject matter of claim in terms of how it is made [i.e., "plastic working by cold extrusion"] is still product claim; it is patentability of product claimed and not recited process steps that must be established, in spite of fact that claim may recite only process limitations", *In re Hirao and Sato*, 190 USPQ 685 (CCPA 1976).

For the purposes of examination, claims 5-7 are interpreted as a product having characteristics consistent with a cold extrusion process performed on a Cu-Mo or Cu-W alloy, such as a lack of cracking. It is not apparent exactly how a "forward extrusion" process or a "rearward extrusion" process would result in a physically distinguishable product over simply

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performing an extrusion process. Thus, claims 6 and 7 are not given any patentable weight beyond that accorded to claim 5.

Osada discloses a semiconductor apparatus that is to be used as a rectifier for an automobile (paragraphs 0004, 0128, 0137), the apparatus comprising a cup-shaped diode base (figure 7b; paragraphs 0121-0122) made of a Cu-Mo sintered rolled material (paragraph 0008, 0031, 0049) having about 35% of Cu by weight (paragraphs 0102, 0120; table 3), and having a coefficient of thermal expansion and a thermal conductivity within the claimed range (see tables 1 and 3; paragraphs 0102, 0120-0122; in paragraph 0120, for example, PCM 35 (35% copper) has a thermal expansion coefficient of 8.5×10^{-6} /K and a thermal conductivity of 200 W/m K), and where the shaped plate has the same characteristics as a plate worked by cold extrusion into the cup shape (paragraphs 0082; 0097; 0121-0122; 0133-0137; it is expected that a cold pressing process using a male and female die that results in no cracking is substantially similar to the claimed product).

Although Osada explicitly states that the cup-shaped Cu-Mo substrate is to be used with a rectifier for an automobile, Osada fails to specifically disclose any of the particulars of the full-wave rectifier device, such as the radiating plate, the solder junction fixing the chip to the bottom surface of the cup, and the lead wires connected to external devices.

Narita discloses a full-wave rectifier for an automotive AC generator, including a radiating plate (1), a cup-shaped diode base (cup portion in figures 2 and 3) mounted on the radiating plate (figure 3); a semiconductor chip (7) mounted using solder (8) on the inner bottom surface of the diode base, and lead wires (2, 3) connected to the chip and to external devices (through 4).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the full-wave rectifier radiating cup disclosed by Osada includes the standard full-wave rectifier device structure disclosed by Narita. The rationale is as follows: Since Osada expressly suggests using the cup-shaped Cu-Mo alloy base as a radiating plate for a full-wave rectifier device but is silent as to the specific device structure, a person having ordinary skill in the art would have been motivated to look to the prior art, such as Narita, to understand exactly what elements are included in such a structure. Since Narita further suggests that the plate and mounting cup metal element (1) is intended for radiating heat, and since Osada teaches that the Cu-Mo 35 alloy provides optimal characteristics for thermal conductivity, thermal expansion, and resistance to cracking, (see Osada, tables 1-3; paragraphs 0102, 0120-0122; 0133-0137), a person having ordinary skill in the art would have been motivated to use the mounting cup/radiating plate of Osada in place of that in Narita, in order to achieve these optimal thermal characteristics.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. U.S. Patent No. 6,198,187 to Asao et al. discloses general information on automotive AC generators.
 - b. Japanese Patent Publication 05-125407 to Arikawa et al. discloses cracking properties of pressing a Cu-Mo alloy.

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c. Japanese Patent Publication 2000-026926 to Son et al. discloses the thermal properties as well as etching and punching properties of a leadframe formed of Cu-Mo alloy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
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